

# SUNANDA SHARMA

sunanda.sharma.92@gmail.com | 774.275.1368 | www.ssunanda.com

Creative biologist & designer passionate about translating laboratory research into the real world to address grand challenges. Experience in developing new technologies for bio-inspired design and manufacturing across scales. Research interests include: astrobiology, remote sensing, microbial evolution in extreme environments, specifically involving ionizing radiation; co-cultivation of organisms in space; pigmentation in extremophiles; and microscopy, spectroscopy, and computational analysis as tools for advancing interdisciplinary biological research.

## EDUCATION

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**Massachusetts Institute of Technology, Cambridge, MA** 2020

*Ph.D. in Media Arts and Sciences, Thesis: "Designing the Organism-Environment Relationship"*

*Advisors: Prof. Neri Oxman, Prof. Ed Boyden, Prof. Danny Hillis*

GPA 5.0/5.0

**Massachusetts Institute of Technology, Cambridge, MA** 2016

*S.M. in Media Arts and Sciences, Thesis: "Design for the Modern Prometheus: Towards an Integrated Biodesign Workflow"*

*Advisors: Prof. Neri Oxman, Prof. Ed Boyden, Dr. Jean Livet*

GPA 5.0/5.0

**Massachusetts Institute of Technology, Cambridge, MA** 2014

*S.B. in Biology, Concentration in Psychology, Thesis: "Behavioral and Electrophysiological Study of Virtual Navigation in Mice"*

*Advisors: Prof. Ed Boyden, Dr. Annabelle Singer*

GPA 4.0/5.0

\*The MIT Media Lab's Media Arts and Sciences program is a science and technology-focused interdisciplinary department that conducts high-impact research supported by corporate funding as well as federal grants. About 20% of the faculty in this department are in the fields of biology or bioengineering. My research focused on experimental biology.

## RESEARCH EXPERIENCE

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**Space Exploration Initiative, MIT, Cambridge, US**

February 2021 - present

*Research Affiliate*

Supporting and expanding astrobiology research and vision in the Initiative. Current main projects are: a microbiological payload for 30-day ISS mission; creating protocols for design and selection of flight hardware, in-flight data measurement, and design of post-flight assays; supporting SEI events focused on life in space and astrobiology.

**Applied and Molecular Microbiology, TU Berlin, DE**

January 2021 - present

*Artist in Residence (Remote) under Prof. Dr. Vera Meyer*

Creating cross-disciplinary bio-art related to pigmentation, astrobiology, and organism-environment relationships focusing on the fungus *Aspergillus niger* as a case study. Experimental design research connecting color theory with pigment science and biodiversity representation, culminating in a video that includes microscopy and animation.

**ex situ bio, Cambridge, US**

January 2021 - present

*Owner / Freelance*

Freelance biologist providing expertise in biological design, 3D printing, biofabrication, biomaterials, laboratory design and operations, imaging and microscopy, and bio-art. Contracted research scientist with Ramona Optics and OPT Industries. Experimental research and ongoing collaborations in astrobiology and space research,

currently focused on incorporation of spectral reflectance data into life detection algorithms with D. Gentry (NASA Ames) and J. Murray (Oxford).

**Oxman, New York, US**

June 2020-December 2020

*Consultant for Oxman / NEOX, LLC Public Benefit*

Lead scientist and biologist focused on experimental research for biological design, natural materials and biological 3D printing, laboratory design and operations, environmental health and safety, custom imaging and microscopy for various biohybrid and bio-architecture projects.

**Media Laboratory, MIT, Cambridge, US**

September 2014-May 2020

*Graduate Research Assistant under Professor Neri Oxman*

Initiated, designed, and led projects on creation of hybrid synthetic-natural biological systems utilizing synthetic and molecular biology and advanced additive manufacturing techniques. Led space biology research which culminated in parabolic and suborbital flights as well as a 30-day mission aboard the ISS and ground-based radiation studies. Co-creator and manager of Biosafety Level 2 laboratory; safety and chemical hygiene officer; trained other lab members in advanced laboratory protocols and skills. Co-taught biology lab and design classes for graduate students; mentored masters and undergraduate students. Led writing for multiple successful federal grant applications (DARPA, NASA-supported), foundation, and corporate proposals.

**Institut Curie, INSERM U934, Paris, France**

June 2014-August 2014

*Research Intern under Professor Edith Heard*

Assisted in breast cancer research conducted in mammalian cells, focusing on the process of X chromosome inactivation as it relates to tumor development. Examined the roles of non-coding regulatory RNAs Xist (X-inactive specific transcript) and Tsix. Conducted immunohistochemistry, general histology, and microscopy for tissue tagging and analysis.

**Media Laboratory, MIT, Cambridge, US**

May 2011-August 2014

*Undergraduate Research Assistant (UROP) under Professor Ed Boyden and Dr. Annabelle Singer*

Designed a collaborative optogenetics project involving manipulation of the basolateral amygdala and hippocampal brain regions. Constructed a VR-based behavioral assay for automated electrophysiology and recording in awake mice. Trained fellow lab members in advanced techniques such as small rodent craniotomy, virus injection, perfusion, fiber implant creation, and behavioral paradigm implementation using Unity and Matlab. Conducted computational analysis of electrophysiological data from awake behaving mice; presented research in international research conferences, classes, and lab meetings.

**Institut de la Vision, INSERM U592, Paris, France**

June 2013-August 2013

*Research Intern under Dr. Jean Livet and Sio-Hoi Leng*

Improved Brainbow techniques for identification of clonal bodies and cell lineage in quail, chick, and mouse. Designed synthetic circuits, executed cloning protocols, conducted injections, microdissections, and confocal microscopy for tissue analysis. Developed algorithm for detection of sister cells in confocal images and visual representation of aggregate data in volumetric image stacks.

**Simons Center for Social Brain, MIT, Cambridge, US**

June 2009-September 2009

*Research Intern under Professor Mriganka Sur and Dr. Damon Page*

Investigated the effect of environmental enrichment on a strain of *Pten* haploinsufficient mice modeling the behavioral and social deficits present in individuals with Autism Spectrum Disorders (ASD). Project selected as an Intel Science Talent Search finalist in 2010.

**Department of Brain and Cognitive Sciences, MIT, Cambridge, US**

June 2008-August 2008

*Research Intern under Professor Pawan Sinha*

Created an image processing and evaluation workflow in Matlab to explore the differences between how individuals with Autism Spectrum Disorders (ASD) and those who are neurotypical integrate and perceive images.

**PEER REVIEWED PUBLICATIONS**

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1. Harfouche M\*, Kim K\*, Konda PC, **Sharma S**, Thomson EE, Zhou KC, Cooke C, Xu S, Yang X, Yao X, Pathak V, Appel R, Cook C, Doman J, Horstmeyer G, Park J, Reamey P, Saliu V, Naumann E, Horstmeyer R. Multi-scale gigapixel microscopy using a multi-camera array microscope (In preparation 2021). (\*joint first authors)

This article experimentally examines microscopic imaging methods that are based upon a densely packed array of “micro-cameras,” to jointly image across a large area at high resolution. Each micro-camera within the array images a unique area of a sample of interest, and then all acquired data is digitally combined together into final composite frames with total pixel counts that significantly exceed standard microscope systems. We describe and present results from three unique configurations of multi-camera array microscope (MCAM) technology. First, we demonstrate an MCAM with 54 micro-cameras that simultaneously images and estimate the 3D depth of objects across a 100 x 135 mm<sup>2</sup> field-of-view (FOV) at approximately 20 micrometer resolution (0.15 gigapixels (GP) per snapshot). Second, we demonstrate the ability to record video across a continuous 83 x 123 mm<sup>2</sup> FOV with a factor of 2 higher resolution (0.48 GP per frame). Third, we record at 2 micrometer resolution across a similar area to rapidly produce 9.8 gigapixel composites of large histopathology specimens.

2. Thomson EE, Harfouche M, Konda PC, Seitz C, Kim K, Cooke C, Xu S, **Sharma S**, Blazing R, Chen Y, Dunn TW, Park J, Jacobs W, Horstmeyer R, Naumann EA. Gigapixel behavioral and neural activity imaging with a multi-camera array microscope (In preparation 2021).
3. **Sharma S**, Wilson SL, Cappelozza S, Saviane A, Bader C, Kraemer F, Costa J, Williams S, Oxman N. Revisiting *Bombyx mori* as a Model Organism for Social Behavior in Lepidoptera (In preparation 2021).

*Bombyx mori*, the most widely recognized member of the Bombycidae family, has had a long and storied history intertwined with humans. Prized for its ability to create fibrous silk which can be used in textiles, it was first domesticated over 5,000 years ago and remains the only fully domesticated insect species. Recent studies have demonstrated the economic value of silkworms, as well as their potential applications in the fields of biomedical engineering, material fabrication, and chemistry. In addition, *B. mori* serves as a model organism for Lepidoptera, and has been the subject of genomic lineage, material, and anatomical studies which have revealed unique characteristics of this family. However, there remains a dearth of information regarding the behavioral characteristics of the silkworm, which inhibits its role as a model organism and prohibits gene-behavior correlation. Here, we establish a set of behavioral assays, modeled after classical studies in other model organisms such as *Drosophila melanogaster*, which characterize the behaviors of hybrid *Bombyx mori* larvae in both foraging and wandering phases of the fifth instar. We adapt a deep learning based approach, DeepLabCut, to analyze video data across three different assays, demonstrating automated analysis of behavioral data of Lepidoptera.

4. **Sharma S\***, Smith RSH\*, Lee N, Wilson SL, Smith M, Oxman N. (2021) Exogenous pigments shield microorganisms from spaceflight-induced changes. biorxiv. <https://doi.org/10.1101/2021.07.29.454367>. (\*joint first authors)
5. **Sharma S**, Begue A, Doman J, Harfouche M, Horstmeyer G, Horstmeyer R. (2021) High Throughput Acquisition and Analysis of Bacterial Colony Features using Gigapixel Microscopy. OSA Imaging and Applied Optics Congress 2021, paper JM4A.2.
6. Smith RSH\*, Bader C\*, **Sharma S\***, Kolb D, Tang T, Hosny A, Moser F, Weaver JC, Voigt CA, Oxman N. (2020) Hybrid Living Materials: Digital Design and Fabrication of 3D Multimaterial Structures with Programmable Biohybrid Surfaces. Adv. Funct. Mater. 30: 1907401. (\*joint first authors)
7. **Sharma S**, Oxman N. (2018) Correlative Computational Image Analysis of Blood Drop Drying Patterns. Microscopy and Microanalysis. 24(S1): 1296-1297.

8. Bader C, Kolb D, Weaver JC, **Sharma S**, Hosny A, Costa J, Oxman N. (2018) Making Data Matter – Voxel Printing for the Digital Fabrication of Data across Scales and Domains. *Science Advances* 4: 5 EAAS8652.
9. Bader C, **Sharma S**, Smith RSH, Disset J, Oxman N. (2018) Viva in Silico: A position-based dynamics model for microcolony morphology simulation. *Artificial Life Conference Proceedings* 30: 304-310.
10. Costa J, Bader C, **Sharma S**, Xu J, Oxman N. (2018) Spinning Smooth and Striated: Integrated Design and Digital Fabrication of Bio-homeomorphic Structures across Scales. *Proceedings of IASS Annual Symposia* 8: 1-4.
11. Keating SJ, Gariboldi MI, Patrick WG, **Sharma S**, Kong DS, Oxman N. (2016) 3D Printed Multimaterial Microfluidic Valve. *PloS ONE* 11(8): e0160624.
12. Bader C, Patrick WG, Kolb D, Hays SG, Keating S, **Sharma S**, Dikovskiy D, Belocon B, Weaver JC, Silver PA, Oxman N. (2016) Grown, Printed, and Biologically Augmented: An Additively Manufactured Microfluidic Wearable, Functionally Templated for Synthetic Microbes. *3D Printing and Additive Manufacturing* 3(2): 79-89.
13. Mogas-Soldevila L, Duro-Royo J, Lizardo D, Kayser M, Patrick WG, **Sharma S**, Keating SJ, Klein J, Inamura C, Oxman N. (2015) Designing the Ocean Pavilion: Biomaterial Templating of Structural, Manufacturing, and Environmental Performance. *Proceedings of IASS Annual Symposia* 16:1-13.

## GRANTS

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Below are successful grant proposals to which I significantly contributed in writing, research, and execution.

1. NASA Supported MIT Space Exploration Initiative – Translational Research Institute for Space Health (Baylor College of Medicine), ‘Melanin Pigment for Radiation Protection’, 2019 – **Co-Investigator** (\$15000); secondary funding, 2020 (\$15000)
2. NASA Astrobiology Institute, Funding to Attend the International Summer School for Astrobiology, 2019 – **Individual Funding** (>\$2000)
3. MIT-SenseTime Alliance on Artificial Intelligence, ‘Living Architectural Symbionts’, 2018 – 2019 (\$100000)
4. Elements Foundation, 2018-2020 (\$1200000)
5. Estee Lauder, 2018 (\$400000)
6. Robert Wood Johnson Foundation, ‘Exploring computational design and digital fabrication for new ways to present biomedical data and develop personalized wearable materials and devices’, 2017 – 2019 (\$600000)
7. Dept. of Defense DARPA Biotechnology Office, ‘Engineered Living Materials Program’, 2017 – 2019 (\$696936)
8. Materials Research Society, Conference Travel Support, 2017 – **Individual Grant** (\$500)
9. MIT Lincoln Laboratory, ‘Artificial Gut for Engineering Microbial Communities’, 2016 (\$30000)
10. John Templeton Foundation, Templeton Grant Recipient, 2016 – **Individual Grant** (\$12000)
11. Mori Building Co, ‘Synthetic Apiary’, 2015-2016 (\$30000)

**Total: \$3,101,436 ; Total Individual and as co-I: \$44,500**

## PATENTS

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*Methods and Apparatus for 3D-Printing of Multi-Material Parts for Graded Chemical Diffusion for Control of Biological Activity.* Published September 12, 2019 (**MIT 20364T**). Provisional Patent Number 62418568 2016, Pending non-provisional patent. C. Bader, R. Smith, **S. Sharma**, D. Kolb, N. Oxman.

## LAUNCHES

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1. *MicroPET: Investigating Microbial and Enzymatic Plastic Degradation in Spaceflight*, SpaceX Dragons CRS24, Tentative: 30 Day Low Earth Orbit on ISS, 2021 (upcoming) – supporting biologist

2. *Biological Pigments for Space Radiation Protection (Radiofungi)*, SpaceX Dragon CRS20, Cape Canaveral US: 30 Day Low Earth Orbit on ISS, 2020 – **co-Investigator**
3. *ZG Stardust*, Zero Gravity Parabolic Flight, Portsmouth US: Parabolic Flight, 2019 – **lead researcher**
4. *Maiden Flight*, Blue Origin *New Shepard*, El Paso US: Sub-orbital Flight, 2019 – supporting biologist

## PRESENTATIONS AND POSTERS

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1. Architected Materials – Additive Manufacturing of Complex Structures at Scale (MRS Congress Fall 2021). Ou J, Ouyang L, **Sharma S**, Chu A. SF02: Additive Manufacturing – From Material Design to Emerging Applications.
2. High Throughput Acquisition and Analysis of Bacterial Colony Features using Gigapixel Microscopy (OSA Imaging and Applied Optics Congress 2021). **Sharma S**, Begue A, Doman J, Harfouche M, Horstmeyer G, Horstmeyer R.
3. Machine Learning for Generation of Biochemical Signatures (Lunar and Planetary Science Conference 2021). **S. Sharma**.
4. Revisiting Pigmentation as a Biomarker and Biosignature for Extraterrestrial Life (American Geophysical Union Conference 2020). **S. Sharma**.
5. Substrate-Mediated Colloidal Assembly for Templating Tunable Structural Color (Materials Research Society Oral Presentation Fall Conference 2020). B. C. Datta, **S. Sharma**, N. Oxman, C. Ortiz.
6. Revisiting Pigmentation as a Biosignature for Extraterrestrial Life (European Astrobiology Network Association Conference 2020). **S. Sharma**.
7. Possibilities for Tunable Structural Color (Living Light Conference 2020). B. Datta, **S. Sharma**, C. Ortiz.
8. Synthesizing Tunable Artificial Color: A Combined Approach (Materials Research Society Oral Presentation Fall 2019). **S. Sharma**, B. C. Datta, V. M. Bove, N. Oxman.
9. Continuous Gradation of Multi-Material Biopolymer Hydrogels (Materials Research Society Poster Fall 2019). N. A. Lee, R. E. Weber, J. H. Kennedy, **S. Sharma**, J. Duro-Royo, N. Oxman.
10. Tunable Melanogenesis in Biopolymer Materials Enabled by Self-Assembling Monolayers (International Society for Biofabrication Conference 2018). J. Van Zak, R. Soo Hoo Smith, **S. Sharma**, C. Bader, J. Faraguna, N. Oxman.
11. Mechanosensitive Cell Behavior on Electrorheological Substrates (Materials Research Society Oral Presentation Spring 2017). B. Datta\*, **S. Sharma\***, V. M. Bove, N. Oxman. (**\*co-first author**)
12. Data-Driven Material Modeling for 3D Printing of Materially Heterogeneous Objects (Biofabrication Poster 2016). C. Bader, D. Kolb, J. Weaver, **S. Sharma**, R. Smith, J. Van Zak, W. Patrick, S. Hays, S. Keating, D. Dikovsky, B. Belocon, P. Silver, N. Oxman.
13. Time course of subthreshold activity preceding spike generation in awake behaving mouse hippocampus (Society for Neuroscience Poster 2014). A.C. Singer, G.T. Franzesi, S. Kodandaramaiah, M. Tsitsiklis, **S. Sharma**, S. Batir, I.R. Wickersham, G.B. Holst, C.R. Forest, C. Borgers, N.J. Kopell, E.S. Boyden.
14. Automated exploration of intracellular mechanisms of in vivo neural computation (Society for Neuroscience Poster 2014). G.T. Franzesi, A.C. Singer, I. Kolb, **S. Sharma**, S. Kodandaramaiah, M. Tsitsiklis, I.R. Wickersham, G.B. Holst, D. Bozic, S. Batir, C.R. Forest, C. Borgers, N.J. Kopell, E.S. Boyden.

15. Beyond the single cycle: increased conductance as a key mechanism throughout the theta state (Cognitive Rhythms Collaborative Dynamics and Cognition Meeting Poster 2014). G.T. Franzesi, A.C. Singer, S.B. Kodandaramaiah, I.R. Wickersham, M. Tsitsiklis, D. Bozic, **S. Sharma**, S. Batir, N. Pak, G. Holst, D. Aronov, D. Tank, N.J. Kopell, C. Borgers, E.S. Boyden.
16. Awake Autopatching: automatic whole cell patch clamp of hippocampal neurons in awake behaving animals (Society for Neuroscience Poster 2013). A.C. Singer, G.T. Franzesi, S. Kodandaramaiah, I. Wickersham, **S. Sharma**, S. Batir, N. Pak, G. Holst, C. Forest, C. Borgers, N.J. Kopell, E.S. Boyden.
17. Awake Autopatching: automatic whole cell patch clamping of neurons in awake behaving animals (Cognitive Rhythms Collaborative Dynamics and Cognition Meeting Poster 2013). G.T. Franzesi, A.C. Singer, S.B. Kodandaramaiah, I.R. Wickersham, **S. Sharma**, S. Batir, N. Pak, G. Holst, C.R. Forest, N.J. Kopell, E.S. Boyden.

## SKILLS AND TRAINING

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**Organisms and Cells:** *E. coli*, *B. subtilis*, *A. niger*, *N. crassa*, *X. dendrorhous*, *R. etli*, *S. elongatus*, *B. mori*, *A. mellifera*, *P. polycephalum*, HEK93, *P. fusiformis*

**Biological:** General microbiology, histology, DNA/RNA/protein purification, cloning, PCR, primer construction, flow cytometry, cell culture, synthetic biology techniques, DNA & RNA FISH, general mycology, radiation biological experimentation, biodesign prototyping, biofabrication, biological 3D printing

**Chemistry:** Biochemical assays, UV-Vis spectrophotometry, H-NMR, HPLC, LCMS

**Imaging:** Widefield, fluorescence, confocal, and scanning electron microscopy, timelapse imaging, optical microscope maintenance

**Fabrication:** 3D printing (Polyjet, FDM, SLA), acrylic finishing, milling, laser cutting, general shop tools

**Programming:** MATLAB, Python, computer vision for deconvolution, image stacking, object counting and tracking, automated phenotyping, Unity for VR behavioral assays

**Materials Science:** Rheometry, viscometry, profilometry, angle-resolved spectroscopy, AFM, biomaterials fabrication, analysis of VIS-NIR-SWIR spectral reflectance datasets

**Applications:** Adobe CC, MS Office, ImageJ/Fiji, Autodesk Suite (Maya, Fusion), Rhinoceros, Geneious, PyMOL, ArcGIS, LabView, Procreate

**Communication:** Grant writing, public speaking, documentation (photography & video)

**Scientific Management:** Biological laboratory design and management, Environmental Health & Safety officer

**Animal Models:** Small rodent handling and behavioral training, murine craniotomy, virus injection, implant and optic fiber creation, optogenetics, perfusion, electroporation, microdissection

**Insect Models:** Insect handling, pinning, sericulture, apiculture, histology, real-time tracking, video tracking and behavioral analysis

**Languages:** English (native), Hindi (conversational), Latin (intermediate), German (beginner), French (basic)

## TEACHING ASSISTANTSHIPS

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Term	Subject	Course Number	Role	Enrolled
FT 2017-18	Hands on Foundations in Media Technology	MAS.500	TA	21
FT 2016-17	Hands on Foundations in Media Technology	MAS.500	TA	12
ST 2015-16	Design Across Scales and Disciplines	4.110/MAS.330/MAS.650	TA	102
FT 2015-16	Hands on Foundations in Media Technology	MAS.500	TA	25
ST 2014-15	Design Across Scales and Disciplines	4.110/MAS.330/MAS.650	TA	56

## OTHER TEACHING EXPERIENCE

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*Elementary/Middle:* DebateMate Mentor (2015), Summer Science Series at the Esplanade (2015)

*Adult:* DMM Eikaiwa English Teacher (2014-2015)

## MENTORSHIP

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During my graduate studies, I formally mentored or co-mentored six undergraduate research interns. I also served as teaching assistant for classes for 6 graduate courses focused on lab biology and biodesign. I served as informal “acting co-PI” for my research group as my professor went on maternity and professional leave from September 2018 to June 2020. During this time, I provided academic support and mentorship to five master’s students and two PhD students.

### Undergraduates Advised and Co-advised

T. Sheng (2021)

A. Mishra (2021)

S. Wilson (2019 – 2020)

S. Vasikaran (2019-2020)

J. Faraguna (2018 – 2019)

O. Omotunde (2018)

J. Xu (2018)

A. Pena-Alcantara (2017)

## ACTIVITIES AND SERVICE

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**Academic Memberships:** American Geophysical Union (2020), Plantae (2020), WISDM MIT (2020), Society for Integrative and Comparative Biology (2019), Microscopy Society of America (2018), MIT Arts Scholars (2017), American Association for the Advancement of Science (2017), Materials Research Society (2016), Institute of Electrical and Electronics Engineers (2016), International Society for Artificial Life (2016), Society for Neuroscience (2014)

**Academic Peer Reviewer:** Technology, Architecture and Design (Taylor & Francis), MIT Science Policy Review

**Workshops & Courses:** MIT Spark 207 NSF iCORPS Program, MIT Venture Exploration Program, American Geophysical Union Mentorship Program 2021, MIT DesignX Bootcamp 2020, MIT Path of Professorship 2019, NASA-ESA Astrobiology Summer School 2019, IEEE Women in Engineering Forum 2017

**Conference Organization:** I have been involved in the organization and hosting of the MIT Space Exploration Initiative’s annual conference, Beyond the Cradle, which unites leaders and visionaries from across space research, industry, and arts from around the world for a multi-day event. At the 2019 conference, I hosted a panel entitled “Life in Space” that featured Dr. Lynn Rothschild (NASA Ames), Dr. Julie Huber (Woods Hole Oceanographic Institute), Prof. Max Tegmark (MIT), and Prof. Emeritus Paul Horowitz (Harvard). For the 2021 conference, I moderated a panel entitled “Life in Space” that featured Prof. Max Tegmark (MIT), Dr. Jill Tarter (SETI), Dr. Nathalie Cabrol (SETI), and Dr. Rohit Bhartia (NASA JPL, Photon Systems).

**Service and Outreach:** MIT Educational Counselor, Intel Society for Science Alumni Classroom Volunteer. During my graduate studies, I regularly volunteered (on average, >20 events/year) for outreach events including demonstrations and tours of our department for school groups, individuals, and visiting researchers. I was part of the MIT Students Offering Support program to encourage women and minorities to apply to the Media Lab. I was an invited speaker at public events on science and design and women in science, and hosted technology and science demonstrations for children every year.

## HONORS AND AWARDS

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### Individual

Marie Skłodowska-Curie Seal of Excellence for Project 101032466, COLORSIGNS (2021)  
MIT Graduate Woman of Excellence (2017)  
Materials Research Society Travel Award (2017)  
MIT Media Lab Departmental Advisory Committee and Funding Award (2016)  
MIT Undergraduate Research Award (2014)  
Intel National Science Talent Search finalist, USA (2010)  
National Merit Scholar, USA (2010)

### As Part of a Team

Fast Company Innovation by Design Sustainability Finalist (2020)  
Fast Company Innovation by Design Experimental Finalist (2020)  
STARTS Prize Nomination (2020)  
Fast Company World Changing Ideas Art & Design Winner (2020)  
Fast Company World Changing Ideas Art & Design Finalist (2020)  
Dezeen Awards Sustainable Design Winner (2019)  
Dezeen Awards Design of the Year Winner (2019)  
Dezeen Awards Installation Design Longlist (2019)  
Emerging Voices (2015)

## INVITED TALKS

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1. Invited Lecturer, “Empathetic Investigation in Biodesign”, Seminar “Meet a Designer”, University of Pennsylvania, October 2021
2. Invited Speaker, “The Colors of Microlife: Exploring Color as a Path to Human Empathy for Microorganisms,” SynBioArt Session, German Conference for Synthetic Biology, Berlin DE, September 2021
3. Panel Moderator, “Life in Space,” Beyond the Cradle MIT Space Initiative Conference Panel, Cambridge US, April 2021
4. Co-Presenter, “Statistical Classification of Biosignature Information,” Collaborative Biosciences Seminar, NASA Ames Research Center, Mountain View US, April 2021
5. Invited Lecturer and Jury Member, “Towards Living Material Architectures”, ARCH 732-008 Inquiry into Biological Material Architectures, University of Pennsylvania, March 2021
6. Invited Speaker, MIT Abstracts Series, MIT Curiosity Correspondents and Nord Anglia Education, December 2020
7. Invited Speaker, Sympoiesis Seminar, Urbonas Studio, November 2020
8. Invited Lecturer, “Experimentation in Space”, Zero Gravity Flight Course, MIT Media Lab, October 2020
9. Invited Keynote, “Interdisciplinary Innovation,” Pune Connected, HSBC Innovation Week, July 2020
10. Invited Speaker and Demonstration, “SEM Small Talks,” MIT Museum, Cambridge US, December 2019
11. Invited Speaker, “Mediated Matter Group,” MIT Media Lab Spring Members Week, Cambridge US, April 2019
12. Panel Moderator, “Life in Space,” Beyond the Cradle MIT Space Initiative Conference Panel, Cambridge US, March 2019
13. Panelist, “2018 National Design Awards Materials & Technology,” Cooper Hewitt Smithsonian Award Event, Boston US, November 2018
14. Invited Speaker, “Wearable Ecology,” Myntra & Jabong Annual Summit, Bangalore India, November 2017
15. Panelist, “International Women’s Day Discussion,” Facebook Live @ MIT Media Lab, Cambridge US, March 2017
16. Panelist, “Generation Elsewhere,” DeVos Institute Debate, Cambridge US, December 2016

17. Invited Presenter, World Economic Forum CEO Workshop, Cambridge US, November 2016
18. Invited Speaker, “Biohybrid Wearables,” Digital Garage New Context Conference, San Francisco US, November 2016
19. Invited Lecturer, SciFab Workshop, Cambridge US, September 2015
20. Invited Presenter, SXSW interactive, Austin US, March 2015

## EXHIBITIONS AND COLLECTIONS

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1. *Colors of Life I* (Video), in collaboration with Vera Meyer/ V.meer, tinyBE (2021)
2. *Farben des Lebens I* (Video), in collaboration with Vera Meyer / V.meer, tinyBE (2021)
3. *Totems*, “Sun Rise Sun Set”, Schinkel Pavillon, Berlin DE (2021)
4. *Radiofungi, Maiden Flight, ZG Stardust*, “Space Has Arrived (MIT Space Exploration Initiative)”, Ars Electronica, Virtual (2020)
5. *Wanderers: An Astrobiological Exploration*, “Beyond the Horizon: Designs for Different Futures”, Walker Art Center, Minneapolis US (2020)
6. *Silk II, Vespers, Totems, Aguaboja, Making Data Matter*, “Neri Oxman: Material Ecology”, Museum of Modern Art, New York US (2020)
7. *Vespers*, “AI Exhibition”, Groninger Forum, Groninger NL (2019)
8. *Work of Neri Oxman and The Mediated Matter Group*, “The Future of Arts”, Mori Art Museum (2019)
9. *Vespers*, “Design for Different Futures”, Philadelphia Museum of Art/Walker Art Center/SAI Chicago, US (2019)
10. *Vespers*, “Exhibition Body Control”, Museum Arnhem, Arnhem NL (2019)
11. *Wanderers: An Astrobiological Exploration*, “Far Out: Suits, Habs, and Labs for Outer Space”, SFMOMA (2019)
12. *Aguaboja II Pavilion and Wall*, “Nature”, Cooper Hewitt Smithsonian Design Museum, New York US (2019)
13. *Aguaboja Wall*, “Nature”, Cube Design Museum, Kerkrade NL (2019)
14. *Vespers*, “AI: More than Human”, Barbican, London UK (2019)
15. *Synthetic Apiary*, “AI: More than Human”, Barbican, London UK (2019)
16. *Totems*, “Broken Nature”, XXII Triennale, Milan IT (2019)
17. *Vespers*, “Smart City: People, Technology, and Materials”, Milan Design Week, Milan IT (2019)
18. *Aguaboja Wall*, “La Fabrique du Vivant”, Centre Pompidou, Paris FR (2019)
19. *Wanderers: An Astrobiological Exploration*, “The Moon”, Louisiana Museum of Modern Art, Humlebaek DK (2018)
20. *Vespers: A Collection of Death Masks*, “Beijing Media Art Biennale: Post Life”, China Academy of Fine Arts, Beijing CN (2018)
21. *Aguaboja Panels*, “Cultural Programs”, National Academy of Sciences, Washington DC US (2018)
22. *Vespers: A Collection of Death Masks*, “NGV Triennial”, National Gallery of Victoria, Melbourne AU (2017)
23. *Synthetic Apiary*, “Alienation: Momentum 9”, The Nordic Biennial for contemporary Art, Moss NO (2017)
24. *Vespers : A Collection of Death Masks*, “Imprimer le monde”, Centre Georges Pompidou, Paris FR (2017)
25. *Wanderers : An Astrobiological Exploration*, ArtScience Museum, Singapore SG (2017)
26. *Vespers*, “&Design”, Tribeca Film Festival, New York US (2018)
27. *Aguaboja I*, Media Lab, Cambridge US (2018)
28. *Vespers: A Collection of Death Masks*, “Fear and Love”, Design Museum, London UK (2016)
29. *Wanderers: An Astrobiological Exploration*, “Beauty: National Design Triennial”, San Jose Museum of Art, New York US (2016)
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